12. CONDUCTING COST/BENEFIT ANALYSES FOR EDI APPLICATIONS

A Cost/Benefit Analysis is a method of evaluating the net financial costs, cost savings, and benefits associated with changing a process or program. The primary purpose of a Cost/Benefit Analysis is to compare the cost of maintaining the current process to the initial investment and ongoing costs necessary to modify or replace that process, and determine whether the implementation of the modified or new process or system will be cost effective.

This section presents a methodology that can be used to estimate and compare costs and cost savings for EDI-based applications. It also defines costs, cost savings and benefits specific to EDI-based applications.

12.1. DEFINITION OF COSTS, COST SAVINGS, AND BENEFITS

Presented below are definitions and lists of the costs, cost savings, and benefits that are typically associated with EDI-based applications. The implementation team should use these lists as a starting point for determining the costs, cost savings, and benefits that are likely to result from implementing the specific application under consideration.

- **Costs:** Costs are additional expenditures, cash outlays, or losses that arise as a result of changing the current process or program. Costs include both one-time and recurring expenditures. Some cost categories that should be considered when implementing EDI-based applications are:

  Hardware for the EDI gateway

  Software (EDI translation software, communications software, etc.)

  Cost of modifying current application systems

  Telecommunications (VAN) charges

  Trading partner outreach program costs

  Ongoing support and maintenance costs

- **Cost Savings:** Cost savings are reductions in expenditures, cash outlays or losses that result from changing a current process or program. Current processing costs are included in this category because they will no longer be incurred if the current process is terminated. Some of the cost savings that are typically associated with the implementation of EDI-based applications are:

Labor costs (from the elimination of data entry, paper document handling, reconciliation and other manually performed tasks)

Mailing costs

Document management costs (on site and off site storage)

- **Benefits:** Benefits are advantages that are gained as a result of changes to the current process or program. Benefits may be quantifiable or non-quantifiable, and include:

  Reduction in data entry error rates

  Improved cash management, including increased interest from reduced cycle time for receiving payments electronically

  Elimination of communication lag time between agency and customer

  Improved customer service

  Expandability of the system to other functions (Using the same translation software for various applications such as procurement, collections, payments, etc.)

12.2. COST/BENEFIT ANALYSIS METHODOLOGY

Once the cost, cost saving, and benefit categories that are expected to arise from a particular application have been defined, the implementation team should conduct a Cost/Benefit Analysis using a well defined methodology. The methodology should provide guidelines for performing, at a minimum, a Cost/Benefit Analysis, Net Present Value Analysis, and Break-even Analysis.

Presented below are a series of steps that the implementation team can use in conducting a Cost/Benefit Analysis for an EDI-based application:

1. **Define Objectives of the Cost/Benefit Analysis:** As a first step in conducting a Cost/Benefit Analysis, the implementation team should define the objectives of the analysis. The methodology used for the analysis should then be tailored to meet the defined objectives.

2. **Develop Assumptions and Constraints of the Cost/Benefit Analysis:** It is likely that the implementation team will have to make a number of assumptions regarding certain aspects of the new application, such as the expected life of the system, implementation timeframes, etc. The implementation team should clearly define all these assumptions and document them as part of the analysis.

Exhibit 12-1, Assumptions Used in Cost/Benefit Analyses for EDI Applications, presents a list of assumptions that are commonly used in conducting cost/benefit analyses for EDI-based applications.

1.	**Useful Life of the New System:** The useful life of the new application over which costs and cost savings will be projected. (OMB standards prescribe a 3 to 7 year period.)
2.	**Development Period:** The period of during which there will be one time software and systems development costs, but no cost savings.
3.	**Start Date:** The project start date that will be used discounting costs and cost savings in the NPV analysis.
4.	**Discount Factor:** The rate that will be used to dicsount costs and cost savings in the NPV analysis. (OMB Circular A-94, prescribe a discount factor of 10%.)
5.	**Constant Dollars:** Costs and cost savings should be based on current estimates, and no inflation rate should be added to labor and material costs over time (OMB Circular A-94).
6.	**Government Costs and Cost Savings:** The CBA should only include costs and cost savings relevant to the government, and not include trading partner costs.
7.	**Salary:** The GS salary schedule should be used to compute all labor costs with an appropriate percentage added to the base salary for benefits.

Exhibit 12-1: Assumptions Used in Cost/Benefit Analyses for EDI Applications

3. **Identify Changes to Current Processes or Systems:** In the planning phase of the EDI implementation, the implementation team should have developed workflows for the current process as well as for the proposed EDI-based application. (A description of the planning phase is presented in Section 10, Planning an EDI Implementation.) As part of the Cost/Benefit analysis, the implementation team should compare the two sets of workflows and identify changes that will result from implementing the new application, such as the elimination of manual data entry or paper-handling functions. The changes should then be used in estimating the costs, cost savings, and benefits of the implementation of the new system.

4. **Collect Data for Cost/Benefit Analysis:** Next, the implementation team should define the source and method of collection of data necessary for calculating each identified cost, cost saving, and benefit. Data can be collected in several ways, and from several sources including the following:

Data on current costs can be collected from the organization using questionnaires. A sample questionnaire is presented in Appendix I.

Data on hardware and software should be obtained from vendors.

Telecommunication costs should be calculated using current and projected transaction volumes and costs obtained from network service providers.

Systems development and ongoing support and maintenance costs should be calculated by estimating the time required for these tasks and multiplying it by an appropriate hourly labor rate.

Team members should divide up the data collection tasks and obtain the data necessary for calculating costs, cost savings, and benefits.

5. **Prepare Cost/Benefit Analysis:** The implementation team should develop an automated spreadsheet model to analyze and display the quantifiable costs and cost savings that will result from implementing the new application. The model should be set up so that data can be entered as separate variables that can be easily changed to perform "what-if" analyses. The model should also calculate the Net Present Value of the application and provide a means for performing a Breakeven Analysis.

   Exhibit 12-2, Sample Cost/Benefit Analyses Results, presents summary costs, summary cost savings, Net Present Value, and Breakeven charts for a sample Cost/Benefit analysis.

6. **Prepare Cost/Benefit Report:** Once the analysis is complete, the project team should prepare a report to present and explain the output contained in the analysis. The report should contain a summary of the findings backed up by all the detailed analysis and calculations. The report should also contain a section stating the conclusions that may be drawn from the analysis.

The results of the Cost/Benefit analysis should be presented to the EDI Steering Committee and should be used as a basis for obtaining the approval and funding necessary to proceed with the implementation.

Cost Summary								
Cost Categories	**Development Periods**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Total**
1. Hardware	$2,500	$0	$0	$0	$0	$0	$0	**$2,500**
2. Software	$3,000	$800	$800	$800	$800	$800	$800	**$7,800**
3. Telecommunications	$0	$700	$1.200	$1,200	$2,100	$2,100	$2,100	**$9,900**
4. Development of Interfface	$10,000	$0	$0	$,	$0	$0	$0	**$10,000**
5. Ongoing support and Maintenance	$20,000	$40,000	$40,000	$40,000	$40,000	$40,000	$10,000	**$200,000**
Total	**$35,500**	**$41,500**	**$42,000**	**$42,500**	**$42,900**	**$12,900**	**$12900**	**$230,200**
Cost Savings Summary								
1. Data Entry	$0	$30,000	$60,000	$75,000	$90,000	$90,000	$90,000	**$435,000**
2. Reconciliation Labor	$0	$10,000	$20,000	$30,000	$30,000	$30,000	$30,000	**$150,000**
3. Mailing Costs	$0	$2,000	$5,000	$7,000	$7,000	$7,000	$7,000	**$35,000**
Total	**$0**	**$42,000**	**$85,000**	**$112,000**	**$127,000**	**$127,000**	**$127,,000**	**$620,000**
Net Present Value Analysis								
Total Cost Savings	$0	$42,000	$85,000	$112,000	$127,000	$127,000	$127,000	**$620,000**
Total Costs	$35,500	$41,500	$42,000	$42,500	$42,900	$12,900	$12,900	**$230,200**
Net Cost Savings	($35,500)	$500	$43,000	$69,500	$84,100	114,100	$114,100	**$389,800**
Discount Rate @ 10%	1.000	0.9091	0.8264	0.7513	$0.6830	0.6209	0.5645	
NPV of Net Cost Saving	($35,000)	$455	$35,537	$52,216	$57,441	$70,847	$64,406	**$245,403**

NPB/Cost Ratio	-100.00%	$1.20%	102.38%	163.53%	196.04%	884.50%	884.50%	
Breakeven Analysis								
NPValue of Cost Saving	$0	$38,182	$70,248	$84,147	$86,174	$78,857	$71,688	**$429,856**
Net Present Value of Cost	$35,500	$37,727	$34,711	$31,931	$31,931	$8,010	$7,282	**$184,462**
Cumulative PV Cost Savings	$0	$38,182	$108,430	$192,577	$192,577	$358,177	$429,856	
Cumulative PW Costs	$35,500	$73,227	$107,938	$139,869	$169,170	$177,780	$184,462	
Breakeven Year			**1998**					

Exhibit 12-2: Sample Cost/Benefit Analyses Results